

## **BIPOLAR WAVEFORM MODULATION FOR ULTRA WIDEBAND (UWB) COMMUNICATION NETWORKS**

### **ABSTRACT OF THE DISCLOSURE**

A method for ultra wideband (UWB) communication in which UWB pulses encode binary data as either normal or inverted (anti-podal) pulses. In the case of pulses of a carrier signal, each pulse has the carrier signal either inverted or in phase, that is, shifted by  $180^\circ$ , or not. For example, a binary "1" may be encoded as a normal or non-inverted pulse and a binary "0" as an inverted pulse. After each carrier pulse is rectified and filtered, detection is effected using a threshold value of zero, resulting in increased immunity to noise, compared with detection of unidirectional pulses. In one aspect of the invention, data pertaining to multiple communication channels are encoded in time-divided portions of each UWB pulse.